US009651912B2

(12) **United States Patent**
Onishi

(10) **Patent No.: US 9,651,912 B2**
(45) **Date of Patent: May 16, 2017**

(54) **IMAGE FORMING APPARATUS**

(71) Applicant: **KYOCERA Document Solutions Inc.**, Osaka (JP)

(72) Inventor: **Kenichi Onishi**, Osaka (JP)

(73) Assignee: **KYOCERA Document Solutions Inc.**, Osaka (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/904,908**

(22) PCT Filed: **May 14, 2015**

(86) PCT No.: **PCT/JP2015/063914**
§ 371 (c)(1),
(2) Date: **Jan. 13, 2016**

(87) PCT Pub. No.: **WO2015/178283**
PCT Pub. Date: **Nov. 26, 2015**

(65) **Prior Publication Data**

US 2016/0147190 A1 May 26, 2016

(30) **Foreign Application Priority Data**

May 22, 2014 (JP) 2014-106344

(51) **Int. Cl.**
G03G 15/00 (2006.01)
G03G 21/14 (2006.01)

(52) **U.S. Cl.**
CPC ***G03G 15/6561*** (2013.01); ***G03G 15/6564*** (2013.01); *G03G 21/14* (2013.01); *G03G 2215/00945* (2013.01)

(58) **Field of Classification Search**
CPC G03G 15/6564
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,610,739 A * 9/1986 Jensen B32B 38/1841 156/324
5,482,265 A * 1/1996 Nakazato G03G 15/6529 271/242

(Continued)

FOREIGN PATENT DOCUMENTS

JP 2001-206583 A 7/2001
JP 2002-326741 A 11/2002
JP 2005-060107 A 3/2005

OTHER PUBLICATIONS

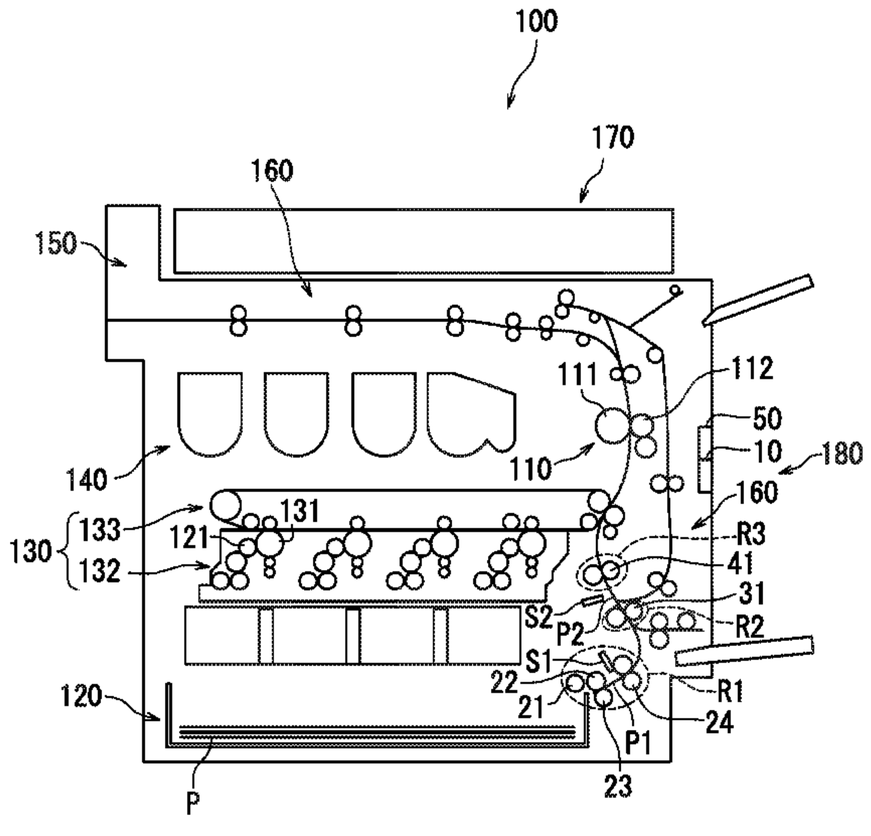
International Search Report; issued in PCT/JP2015/063914; mailed Jul. 7, 2015.

Primary Examiner — Anthony Nguyen
(74) *Attorney, Agent, or Firm* — Studebaker & Brackett PC

(57) **ABSTRACT**

An image forming apparatus (**100**) includes a sheet feed section (**120**), an image forming section (**180**), a sheet feed roller (**21**), a pair of registration rollers (**41**), a pair of intermediate rollers (**31**), a first detection section (S**1**), a control section (**10**), and a storage section (**50**). The control section (**10**) calculates a sheet interval (T**1**) between a preceding sheet (Pa) and a succeeding sheet (Pb) based on a detection result of the first detection section (S**1**). The control section (**10**) determines based on the sheet interval (T**1**) and an ideal sheet interval (Ta), a second-linear-velocity period (T**2**) in which either or both a linear velocity (Vs) of the sheet feed roller (**21**) and a linear velocity (Vm) of the pair of intermediate rollers (**31**) are adjusted to a second linear velocity (V**2**).

5 Claims, 2 Drawing Sheets



(58) **Field of Classification Search**
USPC 399/396
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2002/0176725	A1*	11/2002	Sato	B41J 11/0095 399/388
2006/0251452	A1*	11/2006	Isozaki	G03G 15/6567 399/388
2007/0041762	A1*	2/2007	Ishida	G03G 15/6564 399/388
2008/0258380	A1*	10/2008	Okumura	B65H 5/062 271/258.01
2008/0292334	A1*	11/2008	Takahashi	B41J 11/0095 399/38
2011/0037990	A1*	2/2011	Unno	G03G 15/50 358/1.5
2013/0043647	A1*	2/2013	Fujii	G03G 15/6564 271/226
2014/0056630	A1*	2/2014	Kanno	G03G 15/6529 399/396

* cited by examiner

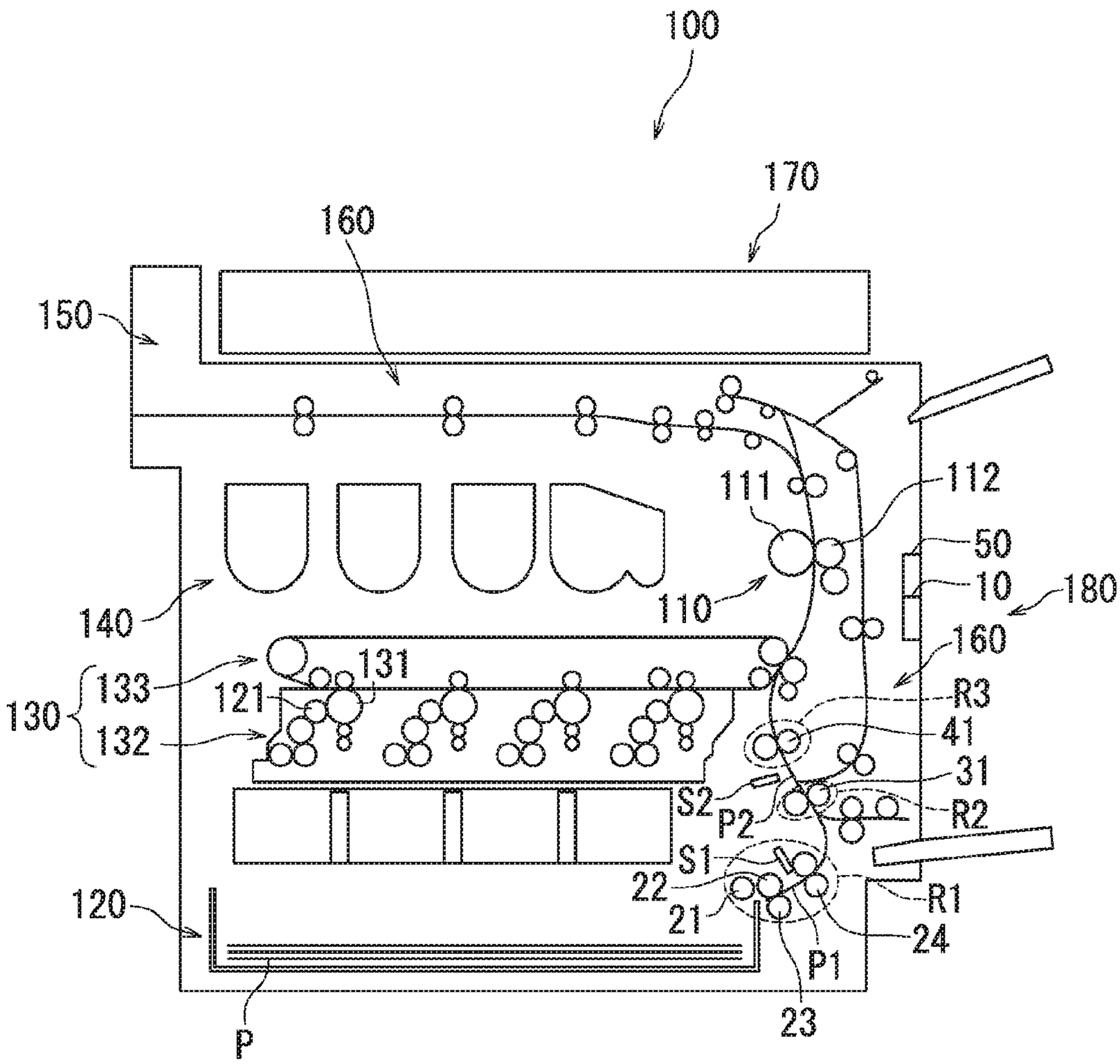

100
170
160
150
111
112
50
10
180
110
140
160
131
133
121
R3
130
132
41
31
S2
P2
R2
S1
22
R1
120
21
24
P1
P
23

FIG. 1

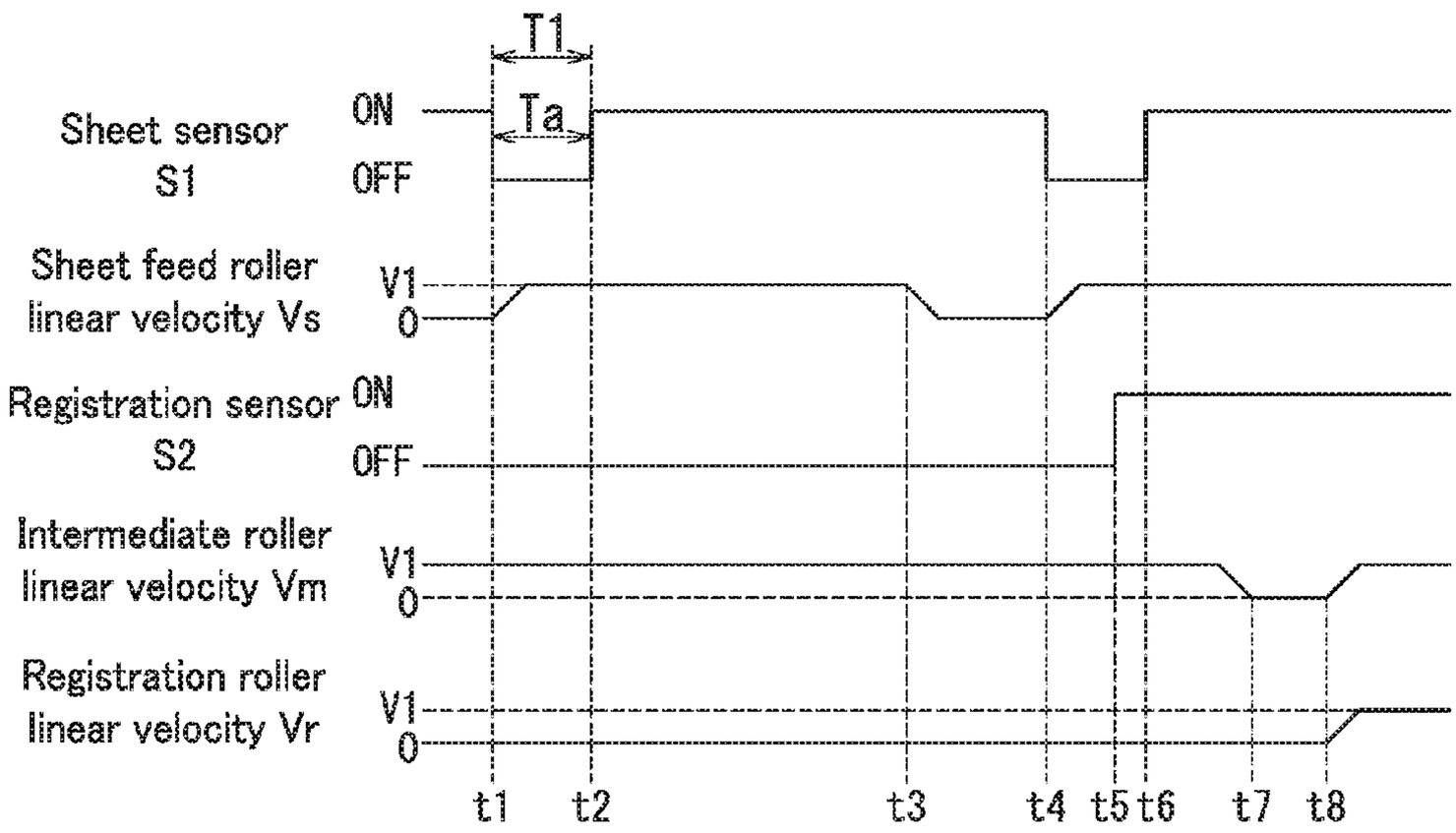

T1
Ta
Sheet sensor S1
ON
OFF
Sheet feed roller linear velocity Vs
V1
0
Registration sensor S2
ON
OFF
Intermediate roller linear velocity Vm
V1
0
Registration roller linear velocity Vr
V1
0
t1
t2
t3
t4
t5
t6
t7
t8

FIG. 2A

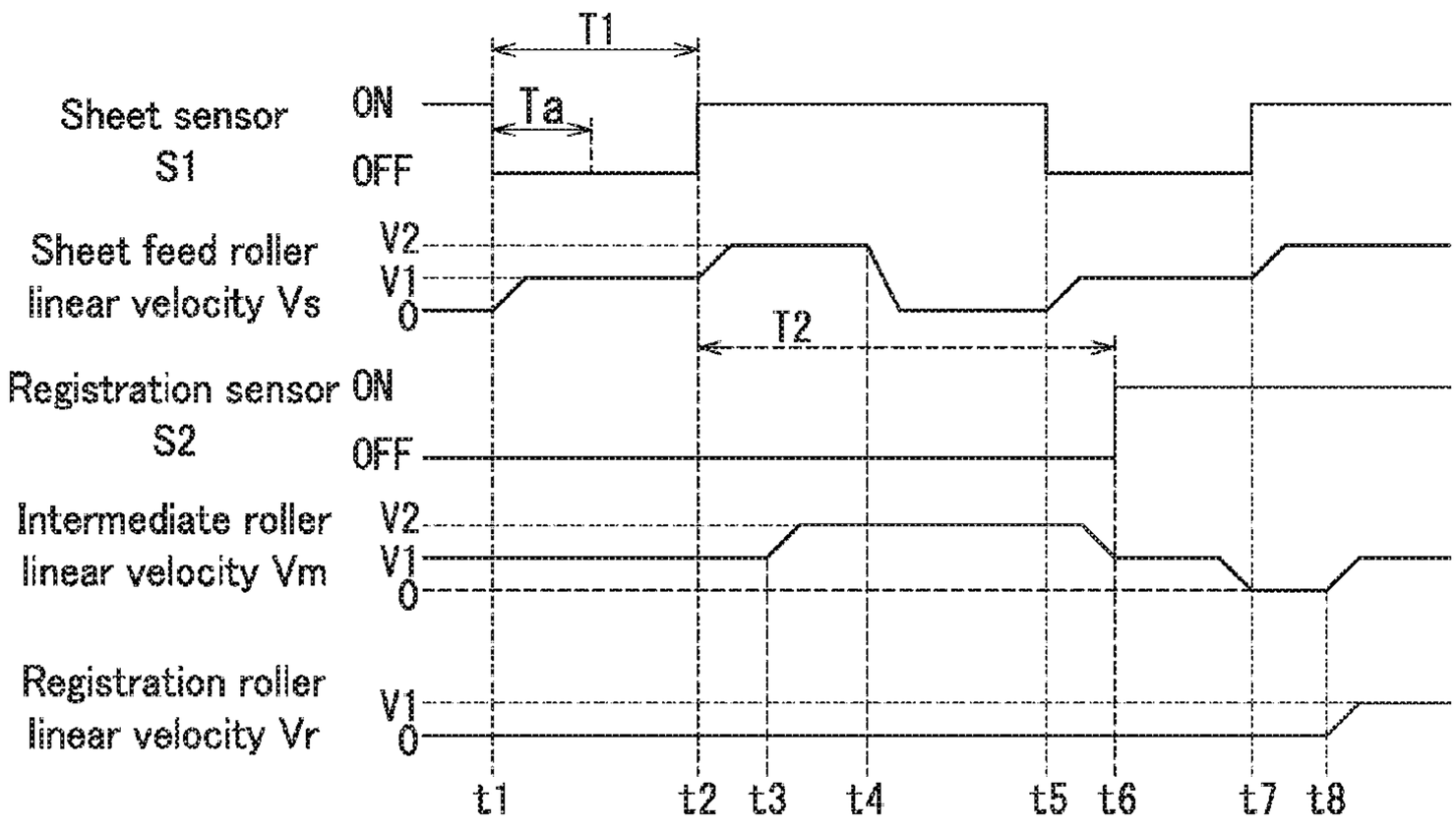

T1
Ta
Sheet sensor S1
ON
OFF
Sheet feed roller linear velocity Vs
V2
V1
0
T2
Registration sensor S2
ON
OFF
Intermediate roller linear velocity Vm
V2
V1
0
Registration roller linear velocity Vr
V1
0
t1
t2
t3
t4
t5
t6
t7
t8

FIG. 2B

IMAGE FORMING APPARATUS

TECHNICAL FIELD

The present disclosure relates to image forming apparatuses.

BACKGROUND ART

In a typical image forming apparatus, a sheet is fed from a sheet feed section by a sheet feed roller and conveyed to a registration roller by a plurality of conveyance rollers. In feeding a sheet, the sheet feed roller may skids on the surface of the sheet to cause delay in sheet conveyance.

In order to reduce variation in sheet feeding timing, an image forming apparatus disclosed in Patent Literature 1 determines a conveyance speed based on timing at which a sensor detects a sheet.

CITATION LIST

Patent Literature

[Patent Literature 1]
Japanese Patent Application Laid-Open Publication No. 2001-206583

SUMMARY OF INVENTION

Technical Problem

However, the conveyance speed may vary according to timing at which a sheet is detected in the image forming apparatus disclosed in Patent Literature 1. This may result in unstable conveyance control. In addition, sheet conveyance at excessively high conveyance speed may generate noise.

The present invention has been made in view of the foregoing and has an object of providing an image forming apparatus capable of performing control for stable conveyance.

Solution to Problem

An image forming apparatus according to the present invention conveys a plurality of sheets along a conveyance path in a conveyance direction. The image forming apparatus forms image on the sheets. The image forming apparatus includes a sheet feed section, an image forming section, a sheet feed roller, a pair of registration rollers, a pair of intermediate rollers, a first detection section, a control section, and a storage section. The sheet feed section is to be loaded with sheets. The image forming section forms an image on a sheet. The sheet feed roller feeds a sheet from the sheet feed section. The pair of registration rollers is disposed downstream of the sheet feed roller in terms of the conveyance direction. The pair of registration rollers performs skew correction on the sheet. The pair of intermediate roller is disposed between the sheet feed roller and the pair of registration rollers. The first detection section detects presence or absence of the sheet at a first detection point located downstream of the sheet feed roller and upstream of the pair of intermediate rollers in terms of the conveyance direction. The control section adjusts a linear velocity of the sheet feed roller and a linear velocity of the pair of intermediate rollers to a first linear velocity or a second linear velocity greater than the first linear velocity. The storage section stores therein an ideal sheet interval that indicates an ideal value of

an interval between a preceding sheet and a succeeding sheet that are conveyed successively. The control section calculates a sheet interval between the preceding sheet and the succeeding sheet based on the detection result of the first detection section. The control section determines based on the sheet interval and the ideal sheet interval, a second-linear-velocity period in which either or both of the linear velocity of the sheet feed roller and the linear velocity of the pair of intermediate rollers are adjusted to the second linear velocity.

Advantageous Effects of Invention

The image forming apparatus according to the present invention can perform control for stable conveyance.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a schematic diagram illustrating an image forming apparatus according to an embodiment of the present invention.

FIG. **2**A is a time chart depicting detection signals of sensors and linear velocities of rollers in the image forming apparatus according to the embodiment of the present invention.

FIG. **2**B is a time chart depicting detection signals of the sensors and linear velocities of the rollers in the image forming apparatus according to the embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

The following describes an embodiment of the present invention with reference to the accompanying drawings. Like reference signs denote like elements or corresponding elements in the drawings, and description thereof is not repeated.

With reference to FIG. **1**, a description will be given about an image forming apparatus **100** according to an embodiment of the present invention. FIG. **1** is a schematic diagram illustrating the image forming apparatus **100** according to the embodiment of the present invention.

The image forming apparatus **100** may be a copier, printer, facsimile machine, or multifunction peripheral having functions of the aforementioned machines. A copier will be described below as an example. However, the present invention is not limited to the copier. The image forming apparatus **100** includes an image reading section **170**, an image forming section **180**, a control section **10**, a storage section **50**, a sheet feed section **120**, a sheet feed roller **21**, a feed roller **22**, a retard roller **23**, a pair of conveyance rollers **24**, a pair of intermediate rollers **31**, a pair of registration rollers **41**, a sheet sensor S**1** (an example of a first detection section), and a registration sensor S**2** (an example of a second detection section). The image forming section **180** includes a fixing device **110**, an imaging section **130**, a toner replenishment device **140**, a sheet ejecting section **150**, and a sheet conveyance section **160**. The image forming section **180** forms an image on a sheet P based on image data generated by the image reading section **170**.

The sheet feed section **120** is loaded with sheets P for printing. In printing, a sheet P loaded in the sheet feed section **120** is conveyed to the image forming section **180** via the sheet feed roller **21**, the feed roller **22**, the retard roller **23**, the pair of conveyance rollers **24**, the pair of intermediate rollers **31**, and the pair of registration rollers **41**.

The sheet feed roller **21** feeds the sheet P from the sheet feed section **120**. The sheet P fed by the sheet feed roller **21** is conveyed to the feed roller **22** and the retard roller **23**. The feed roller **22** is located opposite to and in pressed contact with the retard roller **23**. The feed roller **22** rotates to feed the sheet P in a conveyance direction. When a single sheet P is fed, the retard roller **23** follows the rotation of the feed roller **22** to be rotated. By contrast, when a plurality of sheets P are fed in a layered manner, the retard roller **23** rotates in a direction opposite to a direction in which the sheets P are fed or stops to separate a sheet P in contact with the feed roller **22** from the other sheet P. Thus, the single sheet P is fed by the feed roller **22**.

The pair of conveyance rollers **24** and the pair of intermediate rollers **31** are disposed between the sheet feed roller **21** and the pair of registration rollers **41** and feed the sheet P fed by the feed roller **22** and the retard roller **23**, toward the pair of registration rollers **41** while sandwiching the sheet P therebetween. The pair of registration rollers **41** performs skew correction on the sheet P that comes to stop upon contact with the pair of registration rollers **41**. The pair of registration rollers **41** temporarily holds the sheet P stationary in order to synchronize transfer timing with conveyance of the sheet P and then feeds the sheet P to the image forming section **180** in accordance with the transfer timing.

The sheet P conveyed to the image forming section **180** is conveyed in the conveyance direction along a conveyance path through the imaging section **130** and the fixing device **110** by the sheet conveyance section **160** and ejected from the sheet ejecting section **150**.

The imaging section **130** forms a toner image on the sheet P. The imaging section **130** includes a photoreceptor **131**, a developing device **132**, and a transfer device **133**.

An electrostatic latent image is formed on the photoreceptor **131** using for example a laser. The laser is emitted based on electronic signals representing an original document image generated in the image reading section **170**. The developing device **132** includes a development roller **121**. The development roller **121** supplies toner to the photoreceptor **131** to develop the electrostatic latent image, thereby forming a toner image on the photoreceptor **131**. The toner replenishment device **140** replenishes the developing device **132** with toner.

The transfer device **133** transfers the toner image formed on the photoreceptor **131** to the sheet P.

The fixing device **110** applies heat and pressure to the sheet P using a fixing member **111** and a pressure member **112** to melt the toner image that has been formed by the imaging section **130** and is not fixed yet, thereby fixing the toner image to the sheet P.

The control section **10** controls the rotational speeds of the sheet feed roller **21** and the pair of intermediate rollers **31** to change the conveyance speed of the sheet P by the sheet feed roller **21** and the pair of intermediate rollers **31**. That is, the control section **10** adjusts the linear velocity of the sheet feed roller **21** and the linear velocity of the pair of intermediate rollers **31**. The image forming apparatus **100** includes a roller group R**1**, a roller group R**2**, and a roller group R**3**. The sheet feed roller **21**, the feed roller **22**, the retard roller **23**, and the pair of conveyance rollers **24** belong to the roller group R**1**. The pair of intermediate rollers **31** belongs to the roller group R**2**. The pair of registration rollers **41** belongs to the roller group R**3**. The control section **10** is capable of adjusting the linear velocities on a roller group-by-roller group basis. The sheet feed roller **21**, the feed roller **22**, and the retard roller **23**, which belong to the same roller group, rotate at the same linear velocity.

The storage section **50** stores therein an ideal sheet interval that indicates an ideal value of an interval between a preceding sheet Pa and a succeeding sheet Pb that are successively conveyed.

The sheet sensor S**1** and the registration sensor S**2** detect the presence or absence of a sheet P at respective detection points. The sheet sensor S**1** is disposed downstream of the sheet feed roller **21** and upstream of the pair of conveyance rollers **24** in terms of the conveyance direction of the sheet P (between the sheet feed roller **21** and the pair of conveyance rollers **24**). The sheet sensor S**1** detects the presence or absence of the sheet P at a first detection point P**1**. The registration sensor S**2** is disposed upstream of the pair of registration rollers **41** and downstream of the pair of intermediate rollers **31** in terms of the conveyance direction of the sheet P (between the pair of intermediate rollers **31** and the pair of registration rollers **41**). The registration sensor S**2** detects the presence or absence of the sheet P at a second detection point P**2**.

With reference to FIGS. **1**, **2**A, and **2**B, a description will be given next about operation of the image forming apparatus **100** according to the embodiment of the present invention. FIGS. **2**A and **2**B are time charts depicting detection signals of the sensors and linear velocities of respective rollers in the image forming apparatus **100** according to the embodiment of the present invention.

With reference to FIG. **2**A, a description will be made first about an operation of the image forming apparatus **100** in a situation in which a sheet interval T**1** is not greater than the ideal sheet interval Ta.

Upon the trailing edge of a preceding sheet Pa passing over the first detection point P**1** at a time point t1, a signal output from the sheet sensor S**1** changes from high (on) to low (off). In response to the output signal from the sheet sensor S**1** changing from high to low, the control section **10** changes a sheet feed roller linear velocity Vs from zero to a first linear velocity V**1**. As a result, the sheet feed roller **21** feeds a succeeding sheet Pb from the sheet feed section **120**.

Upon the leading edge of the succeeding sheet Pb passing over the first detection point P**1** at a time point t2, the signal output from the sheet sensor S**1** changes from low (off) to high (on). The control section **10** calculates based on a detection result of the sheet sensor S**1**, a sheet interval T**1** between the preceding sheet Pa and the succeeding sheet Pb that are successively conveyed. For example, the control section **10** calculates a difference (t2−t1) between the time t1 and the time t2 as the sheet interval T**1**. The sheet interval T**1** herein is not greater than the ideal sheet interval Ta. Accordingly, the succeeding sheet Pb is conveyed without any delay relative to ideal time.

At a time point t3, the control section **10** changes the sheet feed roller linear velocity Vs from the first linear velocity V**1** to zero.

Upon the trailing edge of the succeeding sheet Pb passing over the first detection point P**1** at a time point t4, the signal output from the sheet sensor S**1** changes from high to low. The control section **10** accordingly changes the sheet feed roller linear velocity Vs from zero to the first linear velocity V**1**. As a result, the sheet feed roller **21** feeds from the sheet feed section **120**, a sheet Pc that is to be conveyed after the succeeding sheet Pb.

Upon the leading edge of the succeeding sheet Pb passing over the second detection point P**2** at a time point t5, a signal output from the registration sensor S**2** changes from low (off) to high (on).

Upon the leading edge of the sheet Pc conveyed after the succeeding sheet Pb passing over the first detection point P1 at a time point t6, the signal output from the sheet sensor S1 changes from low (off) to high (on).

The control section **10** changes an intermediate roller linear velocity Vm from the first linear velocity V**1** to zero at a time point t7. The pair of registration rollers **41** performs skew correction on the succeeding sheet Pb until the time point t7.

At a time point t8, the control section **10** changes the intermediate roller linear velocity Vm and the registration roller linear velocity Vr from zero to the first linear velocity V**1**. As a result, the succeeding sheet Pb is conveyed to the image forming section **180**.

As described with reference to FIG. **2**A, in a situation in which the sheet interval T**1** is not greater than the ideal sheet interval Ta, the control section **10** determines not to provide a second-linear-velocity period T**2** in which either or both the sheet feed roller linear velocity Vs and the intermediate roller linear velocity Vm are adjusted to a second linear velocity. Therefore, neither the sheet feed roller linear velocity Vs nor the intermediate roller linear velocity Vm is adjusted to the second linear velocity V**2**.

With reference to FIG. **2**B, a description will be made next about an operation of the image forming apparatus **100** in a situation in which a sheet interval T**1** is greater than the ideal sheet interval Ta.

Upon the trailing edge of a preceding sheet Pa passing over the first detection point P**1** at a time point t1, the signal output from the sheet sensor S**1** changes from high (on) to low (off). In response to the signal output from the sheet sensor S**1** changing from high to low, the control section **10** changes the sheet feed roller linear velocity Vs from zero to the first linear velocity V**1**. As a result, the sheet feed roller **21** feeds a succeeding sheet Pb from the sheet feed section **120**.

Upon the leading edge of the succeeding sheet Pb passing over the first detection point P**1** at a time point t2, the signal output from the sheet sensor S**1** changes from low (off) to high (on). The control section **10** calculates based on a detection result of the sheet sensor S**1**, a sheet interval T**1** between the preceding sheet Pa and the succeeding sheet Pb that are successively conveyed. For example, the control section **10** calculates a difference (t2−t1) between the time t1 and the time t2 as the sheet interval T**1**. The sheet interval T**1** herein is greater than the ideal sheet interval Ta. This means that the succeeding sheet Pb is being conveyed behind ideal time.

The control section **10** then determines the second-linear-velocity period T**2** in which either or both the sheet feed roller linear velocity Vs and the intermediate roller linear velocity Vm are adjusted to a second linear velocity V**2**. The second-linear-velocity period may be obtained by Equation 1 below, for example.

$$T2=(V1\times T1-L)/(V2-V1) \quad \text{(Equation 1)}$$

Wherein, T**2** represents the second-linear-velocity period; V**1** represents the first linear velocity; V**2** represents the second linear velocity, and L represents a distance between sheets set for achieving satisfactory productivity. The distance L is preset according to sheet size. The second linear velocity V**2** is determined taking account of noise. The second-linear-velocity period T**2** herein is a period from the time point t2 to a time point t6. In one example, the first linear velocity V**1** may be 200 mm/sec. The second linear velocity V**2** may be 400 mm/sec. The distance L may be 40 mm. The sheet interval T**1** may be 300 ms. The second-linear-velocity period T**2** may be 100 ms.

The control section **10** changes the sheet feed roller linear velocity Vs from the first linear velocity V**1** to the second linear velocity V**2** at the time point t2.

At a time point t3 before the succeeding sheet Pb arrives at the pair of intermediate rollers **31**, the control section **10** changes the intermediate roller linear velocity Vm from the first linear velocity V**1** to the second linear velocity V**2**.

At a time point t4 after the trailing edge of the succeeding sheet Pb passes over the sheet feed roller **21**, the control section **10** changes the sheet feed roller linear velocity Vs from the second linear velocity V**2** to zero.

Upon the trailing edge of the succeeding sheet Pb passing over the first detection point P**1** at a time point t5, the signal output from the sheet sensor S**1** changes from high (on) to low (off). The control section **10** accordingly changes the sheet feed roller linear velocity Vs from zero to the first linear velocity V**1**. As a result, the sheet feed roller **21** feeds from the sheet feed section **120**, a sheet Pc to be conveyed after the succeeding sheet Pb.

Upon the leading edge of the succeeding sheet Pb passing over the second detection point P**2** at the time point t6, the signal output from the registration sensor S**2** changes from low (off) to high (on). Before the signal output from the registration sensor S**2** changes to high, that is, before the registration sensor S**2** detects arrival of the sheet Pb, the control section **10** changes the intermediate roller linear velocity Vm from the second linear velocity V**2** to the first linear velocity V**1**. In this manner, the intermediate roller linear velocity Vm is preferably at the first linear velocity V**1** before being changed from the second linear velocity V**2** to zero.

At a time point t7, the control section **10** changes the intermediate roller linear velocity Vm from the first linear velocity V**1** to zero. Until the time point t7, the pair of registration rollers **41** performs skew correction on the succeeding sheet Pb. Further, upon the leading edge of the sheet Pc, which is being conveyed after the succeeding sheet Pb, passing over the first detection point P**1**, the signal output from the sheet sensor S**1** changes from low (off) to high (on).

At a time point t8, the control section **10** changes each of the intermediate roller linear velocity Vm and the registration roller linear velocity Vr from zero to the first linear velocity V**1**. As a result, the pair of registration rollers **41** conveys the succeeding sheet Pb to the image forming section **180**.

As described with reference to FIG. **2**B, when the sheet interval T**1** is greater than the ideal sheet interval Ta, the control section **10** determines to provide the second-linear-velocity period T**2** in which either or both the sheet feed roller linear velocity Vs and the intermediate roller linear velocity Vm are adjusted to the second linear velocity. In the above configuration, either or both the sheet feed roller linear velocity Vs and the intermediate roller linear velocity Vm are at the second linear velocity V**2** in the second-linear-velocity period T**2**.

As has been described so far with reference to FIGS. **1**, **2**A, and **2**B, the control section **10** calculates the sheet interval T**1** between the preceding sheet Pa and the succeeding sheet Pb based on the detection result of the first detection section (sheet sensor) S**1**. Based on the sheet interval T**1** and the ideal sheet interval Ta, the control section **10** then determines the second-linear-velocity period T**2** in which either or both the sheet feed roller linear velocity Vs of the sheet feed roller **21** and the intermediate roller linear

velocity Vm of the pair of intermediate rollers **31** are adjusted to the second linear velocity V**2**. In the above configuration, even in a situation in which there is a delay in sheet feeding, the second-linear-velocity period T**2** allows the control section **10** to control conveyance of the sheets P at two linear velocities. This can keep constant sheet intervals.

An embodiment of the present invention has been described so far with reference to the drawings (FIGS. **1**, **2**A, and **2**B). However, the present invention is not limited to the above-described embodiment and can be practiced in various ways within the scope without departing from the essence of the present invention. The drawings are schematic illustrations that emphasize elements of configuration in order to facilitate understanding thereof. Therefore, thickness, length, the number, etc. of each of the elements in the drawings may differ from reality for the sake of illustration convenience. The properties of each of the elements, such as material, shape, and dimension thereof described in the above embodiment are mere examples and not specific limitations. A wide range of variations of the properties can be made to the embodiment so long as such variations do not deviate from the intended scope of the present disclosure.

INDUSTRIAL APPLICABILITY

The present invention is applicable to a field of image forming apparatuses.

The invention claimed is:

1. An image forming apparatus that conveys a plurality of sheets along a conveyance path in a conveyance direction and forms images on the sheets, the image forming apparatus comprising:

a sheet feed section to be loaded with sheets;

an image forming section configured to form an image on a sheet;

a sheet feed roller configured to feed a sheet from the sheet feed section;

a pair of registration rollers disposed downstream of the sheet feed roller in terms of the conveyance direction and configured to perform skew correction on the sheet;

a pair of intermediate rollers disposed between the sheet feed roller and the pair of registration rollers;

a first detection section configured to detect presence or absence of a sheet at a first detection point located downstream of the sheet feed roller and upstream of the pair of intermediate rollers in terms of the conveyance direction;

a control section configured to adjust a linear velocity of the sheet feed roller and a linear velocity of the pair of intermediate rollers to a first linear velocity or a second linear velocity greater than the first linear velocity; and

a storage section configured to store therein an ideal sheet interval that indicates an ideal value of an interval between a preceding sheet and a succeeding sheet that are conveyed successively, wherein

the control section calculates a sheet interval between the preceding sheet and the succeeding sheet based on a detection result of the first detection section and the control section determines based on the sheet interval and the ideal sheet interval, a second-linear-velocity period in which either or both of the linear velocity of the sheet feed roller and the linear velocity of the pair of intermediate rollers are adjusted to the second linear velocity,

the image forming apparatus further comprises a second detection section configured to detect presence or absence of a sheet at a second detection point located upstream of the pair of registration rollers and downstream of the pair of intermediate rollers in terms of the conveyance direction, and

the second-linear-velocity period is included in a period from a time point when the first detection section detects arrival of a sheet to a time point when the second detection section detects arrival of the sheet.

2. The image forming apparatus according to claim **1**, wherein

the control section determines whether or not to provide the second-linear-velocity period according to whether or not the sheet interval is greater than the ideal sheet interval.

3. The image forming apparatus according to claim **2**, wherein

the control section determines to provide the second-linear-velocity period when the sheet interval is greater than the ideal sheet interval and determines not to provide the second-linear-velocity period when the sheet interval is not greater than the ideal sheet interval.

4. The image forming apparatus according to claim **1**, wherein

a signal output from the first detection section is switched between on and off according to the presence or absence of a sheet at the first detection point, and

the sheet interval is represented by a period from a time point when the first detection section detects off to a time point when the first detection section detects on.

5. The image forming apparatus according to claim **1**, wherein

the control section changes the linear velocity of the pair of intermediate rollers from the second linear velocity to the first linear velocity before the second detection section detects arrival of the sheet.

* * * * *